

HOW HOMES ARE LOST TO WILDFIRES

Living on the Edge

Each year, homes are destroyed or damaged by wildfires in Tennessee. If you live in or are planning to move to an area where homes are intermixed with woodlands, your home may be in jeopardy, and your life and the lives of your family may be at risk.

Areas where these homes meet the wildlands are known as the **wildland-urban interface**. During the past few years, more families have moved to rural areas intermixed with wildland without addressing the potential dangers from wildfire. These homes are often surrounded by flammable forest fuels, which can lead to an uncontrollable wildfire. Many of these structures will be unable to withstand an intense wildfire.

With this increasing wildland urban interface problem in Tennessee, there is now a greater potential for

- Loss of life
- Property loss
- Damage to natural resources
- More government funds being spent to control wildfires

Many homeowners lack the information they need to adequately safeguard their homes and families in the face of a wildfire. You can help minimize a fire threat to your home and family by following a few safety tips.

Quick Facts:

- A tremendous wildfire danger exists where homes blend together with the wildlands, creating the *wildland-urban interface*.
- Homes in woodland settings are often surrounded by flammable forest fuels.
- Fire is a natural part of Tennessee's environment. Fire has shaped our state for thousands of years.

Just the Right Conditions

Conditions must be just right for a wildfire to start and spread. Firefighters recognize three factors that can influence fire behavior: **weather**, **topography** and **fuels**. These components affect the likelihood of a wildfire starting, the speed and direction of its

spread, the intensity at which it burns and the ability to control and extinguish it.

1. Dry, hot and windy **weather** increases the likelihood of a major wildfire. These conditions make ignition easier, allow fuels to burn more rapidly and increase fire intensity.
 - High **wind** speeds in particular can transform a small, easily controllable fire into a catastrophic event in a matter of minutes. Wind preheats fuel and adds oxygen to the fire, making it easier to ignite and increasing the fire's rate of spread. Wind has a drying effect (fuels dry faster and burn faster under windy conditions).
 - **Temperature** rises can make fuel easier to ignite and contribute to rapid fire spread. High temperatures usually result in lower humidities, further drying out fuels.
 - **Low Humidity** effects fine dead fuels (grass) and can contribute to erratic fire behavior.
 - Low **rainfall** years, like the ones Tennessee has experienced in the past few years, increase fire potential in fuels.

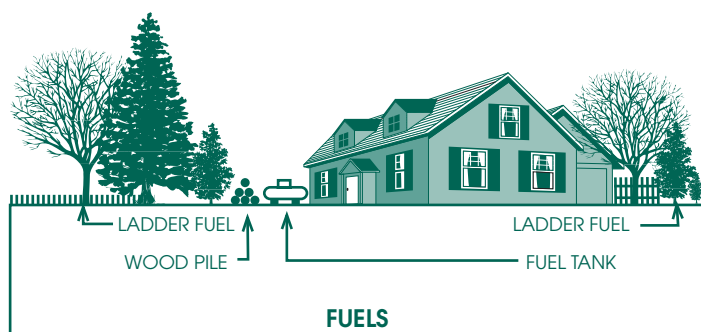
2. **Topography** or the lay of the land plays a major part in how fast a wildfire spreads. Steep **slopes** are the greatest topographical influence on fire behavior. As the steepness of slope increases, fire spread more quickly. A home at the top of a fuel-covered slope is in greater jeopardy than one on flat ground or at the base of the slope in a wildfire. South and southwest slopes usually have more intense fires.

Any landform that changes the wind flow or concentrates heat is especially dangerous. Narrow canyons and saddles can act as



chimneys, channeling wind and fire upslope. Fires burning up a narrow canyon can spread 3-4 times faster with much greater flame lengths than fires under the same conditions on slopes.

Don't build your home in a place where the topography will concentrate heat or where it will channel the wind and increase its velocity. However spectacular the view, don't build your home at the top of a steep fuel-covered slope. "Setting back" the structure from the slope will allow most of the heat, flames and firebrands to go over the house rather than contact it.



3. Fuels: Fuel is required for any fire to burn. Fuels can consist of living vegetation (trees, shrubs, grasses, wildflowers) and dead plant material (dead trees, dried grasses, fallen branches, pine needles). Houses, when involved in a wildfire, become a source of fuel. The amount, size, moisture content, arrangement and other fuel characteristics influence ease of ignition, rate of fire spread, length of flames and other fire behaviors.

Burning fuel can also produce large numbers of firebrands which can be carried aloft for long distances resulting in multiple new fires in advance of the fire.



Any branches or shrubs between 18 inches and 6 feet are considered to be **ladder fuels**. Ladder fuels help convert a ground fire to a crown fire into the treetops which can move much more quickly.

How Your Home Catches Fire

There are three ways that the wildfire can transfer itself from the natural vegetation or other burning homes to your home — through **radiation**, **convection** or **firebrands**.

Radiation: Wildfires can spread to your home by radiating heat in the same way a radiator heats your rooms in the wintertime. Radiant heat is capable of igniting combustible materials from distances of 100 feet or more.

Radiant heat can break windows or melt nonmetallic coverings over building openings, allowing heat or firebrands to ignite the interior. Radiant heat often prevents firefighters from protecting a home because they cannot safely maintain their position.



Convection: Contact with the convection column (flames) may also cause the wildfire to ignite your house. Typically, the convection heat column rises vertically within the smoke plume.

Many homes are lost through either direct flame contact or the concentration of heat under



structures, decks, alcoves and eaves. Convected heat can ignite leaves, litter or combustible material

from radiation, convection, fire brands or any combination of these three.



such as building materials, firewood, patio furniture, etc. which have accumulated or are stored under one of these overhanging structures.

Firebrands: Firebrands are burning materials that detach from a fire during strong convection drafts in the burning zone. Firebrands can be carried long distances — more than a mile — by the winds associated with the wildfire.

The most common way homes are lost is burning embers falling upon flammable roofs (usually of wood shakes or shingles). Falling or wind blown embers easily kindle leaves or needles on the roof, in rain gutters or under decks and porches.



In all cases, your home's building materials and design play a significant role in establishing the level of exposure that can be endured before ignition

Quick Facts:

- **Weather, topography and fuels** all work together to determine how quickly a fire will spread.
- A home at the top of a fuel-covered slope is in greater jeopardy than one on flat ground or at the base of the slope in a wildfire.
- There are three ways that the wildfire can transfer itself from the natural vegetation or other burning homes to your home — through **radiation, convection or firebrands**.

Taking Inventory – Is Your Property at Risk?

- ☐ Do tree limbs extend over your home?
- ☐ Are the trees in good condition or are they dying?
- ☐ Do you have a woodpile in close proximity to your home?
- ☐ Do you have any fuel tanks nearby?
- ☐ Is a wood fence attached to your home?
- ☐ Is there a substantial amount of tall vegetation crowded in around your home?
- ☐ Have wildfires occurred in your area? If so, under what conditions?
- ☐ Do you have seasons when wildfires are more likely to occur?
- ☐ Do you live in hilly or flat country?
- ☐ Are there areas around your home that are more susceptible to a wildfire?
- ☐ Do you border a wildland area (park, forest)?
- ☐ Have you used native vegetation in your landscaping?

How To Change Fire Behavior Characteristics

Although weather and topography cannot be changed, the fuels (or vegetation) can be modified. Consequently, many of our opportunities to reduce your wildfire threat will lie in the proper management and manipulation of wildland vegetation or fuels management. This has become known as the three "R's" of defensible space:

Removal: This technique involves the elimination of entire plants, particularly trees and shrubs, from around your home. Examples of removal are cutting down a dead tree or cutting out a flammable shrub. This will reduce firebrand production and spot fire potential.

Reduction: The removal of plant parts, such as branches or leaves, constitutes reduction. Examples of reduction are pruning dead wood from a shrub, removing low tree branches and mowing dried grass. This will also break up continuous fuels that spread rapidly, reducing the fire's rate of spread.

Replacement: Replacement is substituting less flammable plants for more hazardous vegetation. Removal of a dense stand of flammable shrubs and planting an irrigated, well maintained flowerbed is an example of replacement.



For more information about the Tennessee Firewise Communities Program, contact the Tennessee Department of Agriculture, Division of Forestry, P.O. Box 40627, Nashville, TN 37204; 615-837-5537; Fax: 615-837-5129 or visit our Web site at:
www.state.tn.us/agriculture/forestry